

This is an official DHEC Health Advisory

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Investigation of a Cluster of Cases of Cyclosporiasis

Background Information

The SC Department of Health and Environmental Control (SCDHEC) and the North Carolina Division of Public Health (NC DPH) are investigating a cluster of 6 cases of illness in a group of 13 tourists who ate at several South Carolina restaurants in the Myrtle Beach area in early May 2005. To date, two cases of *Cyclospora cayetanensis* infection (cyclosporiasis) have been laboratory confirmed by CDC.

The only other reported outbreak of cyclosporiasis in SC occurred in 1996 (MMWR 1996;45:549-51). South Carolina has averaged between 0 - 3 reported cases/year since 1999. Nationally, in the past 15 years, approximately 5,000 cases of cyclosporiasis, none of which were known to be fatal, were reported to CDC.

Cyclospora are microscopic, one-celled parasites that infect enterocytes in the small intestine when ingested. They are most commonly spread by ingesting water or food contaminated with infected feces. In many cases, *Cyclospora* infections have been linked to various types of fresh produce. It is unlikely that *Cyclospora* are passed directly from one person to another since when excreted, cyclospora oocysts are not infectious and may require from days to weeks to become infectious (i.e., to sporulate). There is no evidence to suggest animals can be infected or pass this infection to people. The incubation period between ingestion of *Cyclospora* and onset of symptoms is approximately 1 week. Symptoms of cyclosporiasis can include rapid weight loss, severe diarrhea, loss of appetite, bloating, stomach cramps, muscle aches and low-grade fever. Some people who are infected with *Cyclospora* have no symptoms. In very rare instances people that have *Cyclospora* infections may need to be hospitalized.

Recommendations for testing and treatment

SC DHEC is asking health care providers to consider *Cyclospora* infection in patients presenting with an intermittent or persistent diarrheal illness.

Cyclospora infection is diagnosed by identifying the parasite (or parasite DNA) in stool specimens. Most laboratories do not test for *Cyclospora* unless such testing is specifically requested (see specimen processing and testing information below). A single negative stool specimen does not rule out the diagnosis; three or more specimens three or more specimens at 2- or 3-day intervals may be required. Stool specimens should also be checked for other organisms that cause similar illnesses.

Cyclospora infection can be treated with antibiotics or may resolve naturally within a period of a few days up to several months.

The recommended antimicrobial therapy is trimethoprim/sulfamethoxazole (TMP/SMX). Adults should receive TMP 160 mg plus SMX 800 mg (one double-strength tablet) orally twice a day for at least 7 days. Children should receive TMP 5 mg/kg plus SMX 25 mg/kg twice a day for at least 7 days. Patients with AIDS may need higher doses and long-term maintenance treatment. No

alternative antibiotic regimen has been identified yet for patients who do not respond to or are intolerant of TMP/SMX.

Specimen processing and testing for *Cyclospora*:

Specimen processing:

Specimens should be refrigerated and sent to the diagnostic laboratory as rapidly as possible. If it is not possible to send the specimen to the laboratory promptly, it should be preserved. Ideally, because a range of tests might be desired, each of which has different requirements of the specimen, the latter should be split in portions, which should be respectively:

- fixed in 10% formalin (for direct microscopy, concentration procedures, and preparation of stained smears);
- fixed in 2.5% potassium dichromate (for sporulation assays and molecular diagnosis); and
- frozen without fixation (for molecular diagnosis).

(Note: specimens fixed in sodium acetate-acetic acid formalin can be handled in the same manner as specimens fixed in formalin; however, specimens fixed in polyvinyl alcohol (PVA) are of limited value because they are not usable for concentration procedures.)

Cyclospora oocysts can be excreted intermittently and in small numbers. Thus:

- a single negative stool specimen does not rule out the diagnosis; three or more specimens at 2- or 3-day intervals may be required
- concentration procedures should be used to maximize recovery of oocysts. The method most familiar to laboratorians is the formalin-ethyl acetate sedimentation technique (centrifuge for 10 minutes at 500 × g). Other methods can also be used (such as the Sheather's flotation procedure).

Microscopic examination:

It is recommended that concentration procedures be used prior to microscopic examination. The sediment can be examined using various techniques:

- wet mounts (by conventional light microscopy, which can be enhanced by UV fluorescence microscopy or differential interference contrast (DIC, Nomarsky)
- stained smears (using modified acid-fast stain or a modified safranin stain)

SC DHEC Bureau of Laboratories (BOL) Testing:

To detect *Cyclospora*, acid fast staining (AFB) and special UV microscopy are screening tests needed but available only in some labs (ie, public health).

Sample requirements include:

- fresh/raw stool in clean cup with NO preservative,
 - sample may be kept in refrigerator (not freezer) for up to 2 days
- Or
- if delayed testing (weekend or holiday collection) may occur, then 10% formalin or 2.5% potassium dichromate must be added to sample. Equivalent parts stool and preservative are necessary,
 - ship sample at room temp (on wet ice if CDC confirmation is anticipated)

Centers for Disease Control and Prevention Testing:

Smears previously tested for *Cyclospora* at the DHEC BOL should accompany stool samples for confirmatory testing (ie, UV, AFB, and dual PCR).

The correct sample for PCR testing of *Cyclospora* is:

- Equivalent parts of fresh stool and 2.5% potassium dichromate (preferable since its non-flammable),
Or
- Equivalent parts of fresh stool and absolute alcohol

Submit samples on wet cold pack using overnight shipping. All samples must be sent through BOL microbiology to be forwarded to the CDC.

Please call BOL Microbiology @ 803-896-0805 (supervisor Mamie Turner) to alert them that samples are being sent, especially if to be forwarded to the CDC.

* Formalin and absolute alcohol are available from the BOL to Public Health Districts upon request. Potassium dichromate can be obtained but is not on hand at all times.

Links to information about cyclosporiasis:

Clinical management and treatment recommendations:

[http://www.cdc.gov/ncidod/dpd/parasites/cyclospora/healthcare_cyclospora#htm - treatment](http://www.cdc.gov/ncidod/dpd/parasites/cyclospora/healthcare_cyclospora#htm-treatment)

Laboratory diagnostic techniques:

<http://www.dpd.cdc.gov/dpdx/HTML/Cyclosporiasis.htm>

Review article about cyclosporiasis:

<http://www.journals.uchicago.edu/CID/journal/issues/v31n4/000497/000497.web.pdf>

Fact sheets about cyclosporiasis:

<http://www.cdc.gov/ncidod/dpd/parasites/cyclospora/default.htm>

DHEC Contact Information for Reportable Diseases and Reporting Requirements

Reporting of cases or possible cases of cyclosporiasis and outbreaks/clusters of cases is consistent with South Carolina Law requiring the reporting of diseases and conditions to your state or local public health department. (State Law # 44-29-10 and Regulation # 61-20) as per the DHEC 2004 List of Reportable Conditions available at:
http://www.scdhec.gov/health/disease/docs/reportable_conditions.pdf

Federal HIPAA legislation allows disclosure of protected health information, without consent of the individual, to public health authorities to collect and receive such information for the purpose of preventing or controlling disease. (HIPAA 45 CFR §164.512).

District Public Health Offices

Mail or call reports to the District Epidemiology/Disease Reports office in each district.

Appalachia I

(Anderson, Oconee)

220 McGee Road
Anderson, SC 29625
Phone: (864) 231-1966
Fax: (864) 260-5623
Nights / Weekends: 1-(866)-298-4442

Appalachia II

(Greenville, Pickens)

PO Box 2507
200 University Ridge
Greenville, SC 29602-2507
Phone: (864) 282-4139
Fax: (864) 282-4373
Nights / Weekends: (864) 460-5355 or
1-800-993-1186

Appalachia III

(Cherokee, Spartanburg, Union)

PO Box 4217
151 E. Wood Street
Spartanburg, SC 29305-4217
Phone: (864) 596-2227 ext. 210
Fax: (864) 596-3443
Nights / Weekends: (864) 809-3825

Catawba

(Chester, Lancaster, York)

PO Box 817
1833 Pageland Highway
Lancaster, SC 29721
Phone: (803) 286-9948
Fax: (803) 283-0572
Nights / Weekends: 1-(866)-867-3886 or
1-(888)-739-0748

Edisto Savannah

(Aiken, Allendale, Barnwell)

1680 Richland Avenue, W. Suite 40
Aiken, SC 29801
Phone: (803) 642-1618
Fax: (803) 642-1619
Nights / Weekends: (803) 827-8668 or
1-800-614-1519

Edisto Savannah

(Bamberg, Calhoun, Orangeburg)

PO Box 1126
1550 Carolina Avenue
Orangeburg, SC 29116
Phone: (803) 533-7199
Fax: (803) 536-9118
Nights / Weekends: (803) 954-8513

Low Country

(Beaufort, Colleton, Hampton, Jasper)

1407 King Street
Beaufort, SC 29902
Phone: (843) 525-7603
Fax: (843) 525-7621
Nights / Weekends: 1-800-614-4698

Palmetto

(Fairfield, Lexington, Newberry, Richland)

2000 Hampton Street
Columbia, SC 29204
Phone: (803) 576-2749
Fax: (803) 576-2993
Nights / Weekends: (803) 304-4252

Pee Dee

(Chesterfield, Darlington, Dillon, Florence, Marlboro, Marion)

145 E. Cheves Street
Florence, SC 29506
Phone: (843) 661-4830
Fax: (843) 661-4859
Nights / Weekends: (843) 660-8145

Trident

(Berkeley, Charleston, Dorchester)

4050 Bridge View Drive, Suite 600
N. Charleston, SC 29405
Phone: (843) 746-3832
Fax: (843) 746-3851
Nights / Weekends: (843) 219-8470

Upper Savannah

(Abbeville, Edgefield, Greenwood, Laurens, McCormick, Saluda)

PO Box 3227
1736 S. Main Street
Greenwood, SC 29646
Phone: 1-888-218-5475
Fax: (864) 942-3690
Nights / Weekends: 1-800-420-1915

Waccamaw

(Georgetown, Horry, Williamsburg)

2830 Oak Street
Conway, SC 29526-4560
Phone: (843) 365-3126
Fax: (843) 365-3153
Nights / Weekends: (843) 381-6710

Wateree

(Clarendon, Kershaw, Lee, Sumter)

PO Box 1628
105 North Magnolia Street
Sumter, SC 29150
Phone: (803) 773-5511
Fax: (803) 773-6366
Nights / Weekends: 1-(877)-831-4647

Bureau of Disease Control

Acute Disease Epidemiology Division
1751 Calhoun Street
Box 101106
Columbia, SC
Phone: (803) 898-0861
Fax: (803) 898-0897
Nights / Weekends: 1-888-847-0902

Categories of Health Alert messages:

Health Alert: conveys the highest level of importance; warrants immediate action or attention.

Health Advisory: provides important information for a specific incident or situation; may not require immediate action.

Health Update: provides updated information regarding an incident or situation; unlikely to require immediate action